UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
AIR AND RADIATION DIVISION
77 WEST JACKSON BOULEVARD
CHICAGO, ILLINOIS 60604

DATE: June 4, 2007

SUBJECT: Inspection of US Steel - Gary Works

FROM: Brian Dickens, Environmental Engineer
Enforcement and Compliance Assurance Branch

THRU: William L. MacDowell, Chief
Enforcement and Compliance Assurance Section (MN/OH)
Enforcement and Compliance Assurance Branch

TO: File, Mittal Steel – East Chicago, IN

SOURCE NAME AND LOCATION:

US Steel - Gary, IN

DATE(S) OF INSPECTION: May 14, 15, 17 and 18, 2007

PARTICIPANTS:

Dan will write

NEIGHBORHOOD DESCRIPTION:

The mill is located at the south end of Lake Michigan adjacent to other steel mills and other related industries.

OFF-SITE OBSERVATIONS OF PLANT:

The facility has many sources of fugitive emissions so some level of opacity and odor is always present while the facility is operating.

GENERAL PROCESS DESCRIPTION:

US Steel operates an integrated steel mill. The Gary location includes a sinter plant, blast furnaces, basic oxygen process furnaces, casters, slab furnaces, and pickling lines.

PURPOSE AND SCOPE OF INSPECTION:

The purpose of the inspection was to assist in determining compliance with the Clean Air Act (CAA). This inspection report summarizes the blast furnace, boilers, and sinter areas.

APPLICABLE RULES:

US Steel has a Title V permit. This permit lists the applicable requirements for its operations. A summary of several significant provisions is below:

Blast Furnace:

Stoves -

State 6.8-2-38, PM10 lb/MMBTU limit and Lb/hr limit

State 7-4.1-20 for SO2, lb/hr and lb/MMBTU when coke oven desulf on/off

Casthouse 4,6,8,14 (4,6,8 fume suppression, 14 baghouse)-

Suppression system must be in operating, furnaces 4,6,8

Baghouse must be in operation, furnace 14

Subpart 5F,0.01 gr/dscf, any opening 20% opacity, 6 min.

Opacity 5-1-2, 20% 6 min ave (6.8-10 has BOF limits only)

Gas Distribution System

All flares shall be in operation when all furnaces are in operation

Slag Pit

Opacity 5-1-2 20% opacity 6 min ave

Boilers:

#4 Boilerhouse -

Boiler 1 and 2 - 500 MMBTU/hr, burning NG ,BFG, fuel oil

Boiler 3 - 500 MMBTU/hr NG and BFG

All Boilers:

State 6.8-2-38 for PM10 with 2 or 3 boilers running

State 7-4.1-20 for SO2 when CokeOv desulf on/off

Turboblower house -
Boiler 1, 2, 3 - 410 MMBTU, BFG, COG, NG, Fuel oil (1948)
Boiler 4A - 244 MMTBU/hr, NG (1990) Has PEMS for NOx
Subpart Db - Nox lb/MMBTU
Burn Nat gas only

Boiler 5 - 410 MMBTU/hr, BFG, COG, NG, fuel oil ((1958)
Boiler 6 - 710 MMBTU/hr, BFG, NG (1972)
Subpart D, PM lb/mMMBTU and opacity
NOX limit of 0.14 lb/MMBTU

All boilers:
State 6.8-2-38 for PM10 with 2 or 3 boilers running
State 7-4.1-20 for SO2 when CokeOv desulf on/off
Nat. gas use limit

Sinter Plant (3 strands)

Windbox (2 each with quench reactor, dry venture scrubber and baghouse, VOC CEM on each)
Natural gas and COG usage limits for reheat burners
Subpart 5F PM limit 0.4 lb/ton at windbox exhaust
State 6.8-2-38 PM10 grains and lb/hr limits
SO2 state rule 7-4.1-20, lb/hr limit for Coke oven on/off
VOC 2096 lb/day via state rule 8-13-3 (0.36 lbVOC/ton)
Subpart 5F 0.02% ave oil content in feedstock; or
Subpart 5F 0.2 lb VOC emitted/ton sinter 30 day rolling

Discharge End (baghouse on each)
Subpart 5F, Opacity - 20% 6 minute average
Subpart 5F, PM 0.02 gr/dscf from control device,
State 6.8-2-38 PM10 grains and lb/hr limits

Cooler stack
Subpart 5F, 10% opacity, 6 min ave

Misc material Handling
State 6.8-2-38 PM10 grains and lb/hr limits

Process Description

Dan will write

INSPECTION CONFERENCE:

The following topics were discussed.

5/14 - Introduction to US Steel environmental and management teams, process overview, and a driving tour.
Mr. Dickens inquired about the #14 blast furnace project that US Steel claimed increased emissions. US Steel originally proposed to increase emission above new source review (NSR) significant levels, but unfortunately couldn't secure the NOx offsets that would be necessary. US Steel then took production limits to keep it from triggering PSD. Now that #3 coke oven has been removed from service, US Steel has emission credits and is attempting to permit a level of production that exceeds those limits already set by IDEM to avoid NSR.

Mr. Alexander remembered testing at the slag pits to quantify SO2 emissions, but not hydrogen sulfide emissions.

In approximately 1999 Turboblower boilers 1,2,3,5 and 6 all got new controls and burners to burn more blast furnace gas and less natural gas. #6 boiler triggered NSPS Subpart D because its burners allowed the burning of more natural gas.

In approximately 2001, US Steel added a coke oven gas burner to preheat the sinter plant vent before it enters the dry scrubber.

US Steel installed SO2 control (quench reactor and dry venturi scrubber) as a SEP in 1996 in response to an IDEM Findings and Orders

In 1993, US Steel installed the pulverized coal injection project. As part of the project the composition of the flux added to the furnace changed, so there was not necessarily more slag produced after the project.

5/15 - Mr. Dickens asked US Steel to provide the number of blast furnace slips and any root cause evaluations performed for these events. US Steel provided a summary of the total number of blast furnace relief valve openings for the years 2004 - 2006. These totals included both slips and intentional openings because of startup or shutdown. On a separate list, US Steel provided the number of unplanned openings, not including planned startups and shutdowns. Both sets of data show that the number of openings can be large, up to 132 times per month.

5/17 - The group discussed a remediation project that was being performed on US Steel property. The excavation of material was causing emission of benzene. US Steel said it had been monitoring the concentrations of benzene in the atmosphere. The air permitting portion of the project includes several changes to the design and monitoring requirements. IDEM and US Steel understood the project differently. IDEM said it would review the project in more detail and contact US EPA with its findings.

PLANT TOUR:

May 15, 2007

Mr. Dickens observed two bottle cars smoking. Mr. Dickens was looking northeast toward the cars with the sun at approximately 190 degrees. The sky was clear and winds were zero to five miles per hour.
Mr. Gary Levanduski led Mr. Dickens and Ms. Onyszko on a tour of Blast furnace #14. There are four tap holes on the furnace. All have a local hood at the trough and over the iron spout. The group saw #3 hole being tapped. The group saw very little fugitive emissions. However, as tap hole #2 was being opened, apparently all of the collection capacity was directed to the #2 hole since there was no visible movement of air into #3's hood. The group also saw emissions from the cover over the dam at the end of #2 tap hole's trough. There was an opening on the cover. Mr. Levanduski said the operations personnel will inspect the level at the dam approximately every 15 minutes, and need the opening in the cover to do so. The group observed the south slag pit and noted no significant visible emissions.

Furnace #14 has a slag granulator, but it was not in operation during the tour. Mr. Dickens quickly walked past the south slag pit and did not observe significant particulate emissions.

Mr. John Michael led the group through a tour of #8 blast furnace. #8 furnace casthouse is much older and rudimentary than #14. There is an enclosure around the bottle car at the casthouse, but emissions seemed to be emanating from the enclosure. The casthouse used flame suppression and flames were present at close spacing over the runners and trough. There was a large fan in the casthouse blowing across the trough and runners. When Mr. Dickens stood on

the downwind side of the trough, the hydrogen sulfide odors were overpowering.

Mr. Michael explained that the water associated with the #8 blast furnace operates in a closed system. Water from the gas scrubber is sent to a clarifier where solids are removed. This same water is sprayed onto the hot slag in the pit. As a result of this arrangement, US Steel expects to emit CO from the clarifier and the amount of makeup water is the same as that lost as steam at the slag pits.

We observed #6 blast furnace slag pit. Because of the steam and poor weather conditions, we could not judge the particulate emissions. The slag pit had a large screen enclosure that was approximately 25 feet above the pit that covered the area above and around the slag spout. Mr. Michael said this screen was installed for safety reasons to prevent pieces of slag from exploding upwards when hot slag hits water pockets in the pit.

5/17/07

Tube City IMS Corporation (IMS) handles slag from steel making (BOF shop) operations. Mr. Raymond Rivas of IMS and Mr. Mark Henry of US Steel led Mr. Dickens on a tour of its operations, which has the purpose of recovering steel from the slag and then sizing and selling the slag. Steel slag is tapped into ladles at the BOF shop and then carried by wheeled haulers to a building that formerly housed #4 open hearth furnace. The building remains, but has large openings in it for the ladle hauler and end loaders to enter and dump and remove slag. Mr. Dickens viewed the dumping of the ladle into the pit and noticed little fugitive emissions. At the end of the dump, however, the hauler bangs the ladle on a structure above the pit to dislodge any clinging material. This operation produced significant visible emissions for approximately 3 minutes that dispersed somewhat before exiting the building. At the end of the tour, Mr. Alexander provided examples of visible emission readings that were taken at the IMS operation. They showed very low opacity being emitted. Mr. Dickens speculated that the readings were taken as they exited the building. Mr. Dickens and Mr. Alexander had a discussion about whether the building around the IMS operation was intended to be a building and subject to a zero percent opacity limitation in the IAC 6.8 Fugitive Emission rules. Mr. Dickens stated that if IMS and US Steel considered the IMS area a building, then the zero percent opacity limit would apply. If the area was

not a building, then reading should be performed on the operation itself, inside the area, and would be far higher than those taken as they left the area.

Mr. Henry and Mr. Dickens then met with Mr. Mike Perkins of Levy Indiana Slag Company, which handles slag from the #4, #6, and #8 blast furnaces. These operations were miles away from the blast furnaces, but still on US Steel property. Mr. Dickens observed a slag hauling truck, which transports the slag from the slag pits out to the Levy operations, dump its load of slag to the slag pile. The emissions were minimal.

5/18/07

Mr. Dickens met with Mr. Henry and headed to #8 blast furnace. As the two walked to #8 at approximately 09:56, the pair's personal CO monitors alarmed. Mr. Henry explained and US Steel operations personnel later confirmed that the blast furnace gas collection flare flame had gone out and CO was being emitted into the area. The flare is supposed to have a flame present at all times to combust the CO. Mr. Henry said the Turboblower powerhouse records these flame outages. Because of high frequency of the flame outage, US Steel was installing an auto-igniter at the tip of the flare to ensure a pilot is always present. The pair continued on to blast furnace #8 where they met Mr. Don Ramsey and Mr. Michael.

The group observed the blast furnace dust catcher dump its contents into a hauling truck. US Steel uses a gate valve at the exit of the dust catcher and water sprays to reduce dust emissions. While the dump took place, Mr. Dickens observed very little fugitive dust.

Mr. Dickens and Mr. Henry then visited the #8 blast furnace slag pit. Mr. Dickens took visible emission readings at the pit. For some period of time while the readings were being taken, Levy was building the end dam on a pit row.

Mr. Dickens then took visible emission readings of the #6 blast furnace top. There were emissions and Mr. Henry speculated that they were caused by leaking bell valves that are used to charge the furnace with raw materials. US Steel replaces the bell valves when the level of particulate emissions gets excessive. US Steel performs periodic visible emission readings of the furnace tops so it can trend emissions.

Finally, Mr. Dickens and Mr. Henry drove to the sinter plant. Mr. Micky Radovich of US Steel explained the operations and its emission control. The emissive vent stream from the strands is directed to a quench reactor where it contacts a water and lime mixture. The vent gas from the quench reactor then flows to a dry venturi where dry lime is injected. A baghouse collects the lime and the cleaned stream exits out of a stack to atmosphere. The cooler is covered and discharges through a stack. Mr. Dickens saw #1 and #3 lines running. There were no visible emissions from the discharge stacks, cooler stacks, or windbox stacks. Mr. Radovich said the plant was running normally.

RECORDS REVIEW AND DISCUSSION:

Mr. Dickens reviewed the following records:

Correspondences pertaining to the soil remediation project that resulted in benzene emissions, called the CAMU project.

An information request from EPA to US Steel pertaining to the Pulverized Coal Injection project, and US Steel's response.

The permit application for #13 blast furnace reline, which resulted in the renaming to #14 blast furnace.

Third and fourth quarter 2006, and first quarter 2007 Title V quarterly reports. There were many violations reported.

Blast furnace relief valve opening records.

DISCUSSION, FINDINGS AND RECOMMENDATIONS (separate from report)

AREAS OF VIOLATION

Visible Emission exceedance from interplant transfer of product, exceeding 0% opacity, in violation of IAC 6.8-10-3-6. EPA witnessed several smoking hot iron transfer railcars (bottle cars).

Visible emission exceedance at #8 slag pit, in violation of IAC 6.8-10-3-4. EPA took visible emission readings and the opacity exceeded 10% on a 3 minute average.

Failure to control emissions from blast furnace #14, #3 tap hole while tapping, in violation of the Title V permit. The permit requires operation of the control system at all times the casthouse is in operation. US Steel removed suction from #3 tap hole when it opened #2 tap hole. We believe this to be normal practice when more than one hole is tapped.

Failure to control emissions from blast furnace #14, iron dam emissions were not captured by a control system, in violation of the Title V permit that requires operation of the control system at all times the casthouse is in operation.

Failure to operated the flare and have a flame present when the blast furnaces are in operation, in violation of the Title V permit. The flame periodically goes out and CO from the blast furnace is not combusted as it must be.

Visible emissions exceedance from slag skimming at the QBOP shop. This operation resulted in visible emissions over 0% out of the QBOP building, in violation of IAC 6.8-10-3-7(D).

IMS opacity violations during steel slag ladle dumping. This operation resulted in emissions over 0% opacity out of the building, in violation of IAC 6.8-10-3-7(D).

AREAS OF CONCERN

Failure to list as an emission source blast furnace relief valves. These valves open often enough, and with enough emission to be considered an "emission source", not a malfunction. This

would be a violation of Indiana PTI and possibly of SIP particulate control regulations.

Emissions from #4, 6, and 8 blast furnace iron spouts that escape out of the building that surrounds the bottle car and spout. These could be violations of IAC 6.8-10-3-7(D), which requires 0% opacity from buildings.

There were many (over 20 for the last 3 quarters) violations of opacity and other standards reported in Title V quarterly reports. The question is which agency will lead the enforcement for them.

Standard bcc's: official file copy w/attachment(s)
originator's file copy w/attachment(s)

Other bcc's:

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